CLAIMS

What is claimed is:

1. A method of inducing an immune response to anthrax in a subject, comprising administering to a mucosal surface of a subject a composition comprising at least one anthrax peptide and a mucosal adjuvant in an amount suitable for inducing an immune response to anthrax in said subject.

2. A method of inhibiting replication of anthrax in a subject, comprising administering to a mucosal surface of a subject in whom anthrax is replicating a composition comprising at least one anthrax peptide and a mucosal adjuvant in an amount suitable for inducing an immune response suitable for inhibiting anthrax replication in said subject.

3. The method according to claim 1 or 2, wherein said anthrax peptide is selected from the group consisting of PA, LF, EF, PGA, and BclA.

4. The method according to claim 1 or 2, wherein said anthrax peptide induces an immune response to a member of the group consisting of a vegetative anthrax bacterium, an anthrax spore, and an anthrax exotoxin peptide.

5. The method according to claim 1 or 2, wherein said composition further comprises a second anthrax peptide.

6. The method according to claim 5, wherein said anthrax peptide induces an immune response to a vegetative anthrax bacterium and said second anthrax peptide induces an immune response to an anthrax spore.

7. The method according to claim 5, wherein said anthrax peptide induces an immune response to a vegetative anthrax bacterium and said second peptide induces an immune response to an anthrax exotoxin.

8. The method according to claim 5, wherein said anthrax peptide induces an immune response to an anthrax spore and said second peptide induces an immune response to an anthrax exotoxin.

9. The method according to claim 5, wherein said first peptide is PA and said second peptide is PGA.

10. The method according to claim 9, wherein said PA is conjugated to said PGA.

11. The method according to claim 1 or 2, wherein said mucosal adjuvant is selected from the group consisting of an agonist of a Toll-like receptor, a signaling transducer receptor of lipopolysaccharide. MPL, TDM, a positively charged linear polysaccharide, chitosan.

12. The method according to claim 1 or 2, wherein said mucosal adjuvant comprises an agonist of a Toll-like receptor and a positively charged linear polysaccharide.

13. The method according to claim 12, wherein said Toll-like receptor is TLR4.

14. The method according to claim 12, wherein said agonist is MPL.

15. The method according to claim 1, wherein said anthrax peptide comprises PA and said mucosal adjuvant comprises MPL and/or chitosan.

16. The method according to claim 1, wherein said immune response is selected from the group consisting of a protective immune response and a therapeutic immune response.

17. The method according to claim 1, wherein said mucosal surface is selected from the group consisting of a nasal mucosal surface and an oral mucosal surface.

18. The method according to claim 1, wherein said immune response comprises a T cell response or a B cell response.

19. A method of neutralizing an anthrax exotoxin in a subject comprising administering to a mucosal surface of a subject a composition comprising at least one

isolated anthrax exotoxin peptide and a mucosal adjuvant in an amount suitable for inducing an immune response suitable for neutralizing said anthrax exotoxin in said subject.

20. The method according to claim 19, wherein said anthrax peptide is selected from the group consisting of PA, LF, and EF.

21. The method according to claim 19, wherein said composition further comprises a second peptide that induces an immune response to an anthrax spore, or a vegetative anthrax bacterium.

22. The method according to claim 19, wherein said mucosal adjuvant is selected from the group consisting of an agonist of a Toll-like receptor, a signaling transducer receptor of lipopolysaccharide, MPL, TDM, a positively charged linear polysaccharide, chitosan.

23. The method according to claim 19, wherein said mucosal adjuvant comprises an agonist of a Toll-like receptor and a positively charged linear polysaccharide.

24. The method according to claim 23, wherein said Toll-like receptor is TLR4.

25. The method according to claim 23, wherein said agonist is MPL.

26. The method according to claim 47, wherein said polysaccharide is chitosan.

27. The method according to claim 19, wherein said anthrax peptide comprises PA and said mucosal adjuvant comprises MPL and/or chitosan.

28. The method according to claim 19, wherein said immune response is a protective immune response or a therapeutic immune response.

29. The method according to claim 19, wherein said mucosal surface is a nasal mucosal surface or an oral mucosal surface.

30. The method according to claim 19, wherein said immune response comprises a T cell response or a B cell response.

31. The method according to claim 19, wherein said adjuvant is capable of acting as a depot.

32. A composition suitable for inducing an immune response to anthrax in a subject when administered to a mucosal surface of said subject, comprising at least one isolated anthrax peptide and a mucosal adjuvant in an amount suitable for inducing immunity to anthrax in said subject.

33. The composition according to claim 32, wherein said anthrax peptide is selected from the group consisting of PA, LF, EF, PGA, and BclA.

34. The composition according to claim 32, wherein said anthrax peptide induces an immune response to a vegetative anthrax bacterium, an anthrax spore, or an anthrax exotoxin.

35. The composition according to claim 32, wherein said composition further comprises a second anthrax peptide.

36. The composition according to claim 35, wherein said anthrax peptide induces an immune response to a vegetative anthrax bacterium. and said second peptide induces an immune response to an anthrax spore.

37. The composition according to claim 35, wherein said anthrax peptide induces an immune response to a vegetative anthrax bacterium and said second peptide induces an immune response to an anthrax exotoxin.

37. The composition according to claim 35, wherein said anthrax peptide induces an immune response to an anthrax spore and said second peptide induces an immune response to an anthrax exotoxin.

38. The composition according to claim 35, wherein said anthrax peptide is PGA and said second peptide is PA.

39. The composition according to claim 38, wherein said PA is conjugated to said PGA.

40. The composition according to claim 32, wherein said mucosal adjuvant is selected from the group consisting of a Toll-like receptor, a signaling transducer receptor of lipopolysaccharide, MPL, TDM, chitosan, a positively charged linear polysaccharide, and chitosan.

41. The composition according to claim 32, wherein said mucosal adjuvant comprises an agonist of a Toll-like receptor and a positively charged linear polysaccharide.

42. The composition according to claim 41, wherein said Toll-like receptor is TLR4.

43. The composition according to claim 41, wherein said agonist is MPL.

44. The composition according to claim 41, wherein said polysaccharide is chitosan.

45. The composition according to claim 32, wherein said anthrax peptide comprises PA and said mucosal adjuvant comprises MPL and/or chitosan.

46. The composition according to claim 32, wherein said immune response is a protective immune response or a therapeutic immune response.

47. The composition according to claim 32, wherein said mucosal surface is a nasal mucosal surface or an oral mucosal surface.

48. The composition according to claim 32, wherein said immune response comprises a T cell response or a B cell response.